
**On the discovery of a new ichnofossil assemblage from
the Early Carboniferous Bloomfield Formation in
Bloomfield, New Brunswick**

M. STIMSON^{1,2}, S. HINDS¹, AND A. MACRAE²

1. *Geologic Surveys Branch, New Brunswick Department of
Natural Resources, Fredericton, New Brunswick E3B 5H1* ¶

2. *Department of Geology, Saint Mary's University,
Halifax, Nova Scotia B3H 3C3*

A new invertebrate ichnofossil assemblage has been discovered in Bloomfield, New Brunswick (45° 34'11.94" N, 45° 44'54.91" W). An array of ichnogenera have been identified from three stratigraphic horizons exposed within the Midway Quarry and surrounding road cut outcrops in the Bloomfield area. Ichnogenera include: *Cruziana*, *Dendroidichnites*, *Diplichnites*, *Diplopodichnus*, *Kouphichnium*, *Paleohelcura*, and *Rusophycus*. The sedimentary package is assigned to the upper Horton Group, lower Bloomfield Formation. This assignment is based on rare plant fossils (i.e., *Lepidendropsis*), previous spore analysis, and lithostratigraphy from new structural and stratigraphic mapping. Three sedimentary facies are identified: the lower and middle fine grained mottled and alternating red-grey transitional facies, an intermediate reduced, planar siltstone-mudstone dominated aquatic facies and an upper well-drained red-bed, fine sandstone and channel-sandstone-dominated facies. The lower reduced facies is dominated by grey, planar siltstones with centimetre-scale microripples and interference ripples. The lower and middle transition facies contain dominantly alternating reduced and oxidized mudstones. The upper fluvial red-bed facies contains is dominated by red fine sandstones with current ripples, climbing ripples and trough cross-beds, with localized reduced bedding surfaces. Trackways are preserved on reduced shaley siltstone beds

within the lower reduced and basal red-bed facies. Within the uppermost red-bed strata, reduced beds are rare and trackways are preserved on red laminated siltstone horizons. Ichnofossil assemblages represent both aquatic and terrestrial conditions. Trace fossil assemblage 1 within the lower reduced sedimentary facies contains surface trackways of *Kouphichnium* and *Diplichnites*, tentatively interpreted to be produced by limulids and tealiocarid shrimp respectively. *Cruziana*, *Dendroidichnites*, *Diplopodichnus* and *Rusophycus* are here interpreted to be morphological and behavioral variations produced by the same invertebrates. Trackway assemblage 2 of the upper redbed sequence is dominated by *Paleohelcura* and *Diplichnites* walking traces, and are tentatively interpreted to be produced by scorpions and myriapods. The *Kouphichnium* trackways discovered in the upper Horton Group are evidence of limulid activity in the Maritimes Basin during the late Tournasian/early Visean of New Brunswick. Modern-day limulids are marine animals with a high salinity tolerance for brackish conditions. This ichnofauna could be explained by the Horton Group being periodically connected to the sea as has been suggested for the Horton Group of Nova Scotia by other workers. The depositional setting for these sediments and traces is tentatively interpreted to represent a shallow, near-shore, low energy embayment, likely under local fresh water conditions with a distant marine connection.